UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,704	06/25/2003	Michael Philip Hagle	123260 (21635-0088)	3432

31450 7590 01/11/2006

MCNEES WALLACE & NURICK LLC
100 PINE STREET
P.O. BOX 1166
HARRISBURG, PA 17108-1166

EXAMINER	
COMPTON, ERIC B	
ART UNIT	**PAPER NUMBER**
3726	

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/603,704	HAGLE ET AL.	
	Examiner	Art Unit	
	Eric B. Compton	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-15* is/are pending in the application.

4a) Of the above claim(s) *8 and 13-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7 and 9-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Species A (new-make assemblies) in the reply filed on October 27, 2005, is acknowledged. There is some argument as to what the various Species are drawn to. Applicant's invention for providing a wear-resistant assembly is drawn to two primary embodiments: (1) a method for fabricating "new-make" assemblies; and (2) a method for refurbishing worn or damaged assemblies that have been in service. See Specification at [0007].

The Examiner agrees that claims 1-7 and 9-12 are drawn to this first embodiment. *See* Specification at [0009]. However, claims 8, and 13-15 are drawn to the refurbishing embodiment, since these claims require the step of "placing the assembled turbine vane and turbine outer case into service in a turbine engine, thereafter taking the assembled gas turbine vane and gas turbine outer case out of service."

Thus, based on Applicant's election of Species A, claims 1-7 and 9-12 will be examined.

2. Claims 8 and 13-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species.

Double Patenting

3. Claim 7 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 2. When two claims in an application are duplicates or else are so close in

content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, and 3-5, are rejected under 35 U.S.C. 102(e) as being anticipated b U.S. 2002/0189722 to Hasz et al.

Hasz discloses a method for fabricating a wear-resistant assembly of a turbine outer case (14) and a turbine vane (16) , comprising the steps of:

providing

a turbine outer case (16);

a turbine vane (12) that, when assembled, is supported on the turbine outer case in a support region whereat a vane-supported area of the turbine vane contacts a case-support area of the turbine outer case, *see* Figure; and

welding a wear-resistant material to at least one the vane-supported area and the case-supported area, *see* Figure (Area A); [0012] ("The wear coating prevents

unwanted wear due to abutting contact and relative movement between the nozzle 10, shroud 14, and shroud hanger 16."); [0030] (disclosing welding techniques may be used to join wear-resistant material to substrate).

Regarding claim 3, the outer case and vane may be a nickel-base alloy, *see* [0010], and the wear-resistant material a cobalt-base alloy, *see* [0016].

Regarding claims 4-5, "The wear coating can be applied on any one of or any combination of nozzle 10, shroud 12, and shroud 16." [0012]

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-5 and 7-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of U.S. Pat. 5,360,961 to Ingall et al and/or JP 11-336502 to MITSUBISHI.

AAPA discloses in the Specificaiton:

> [0003] In the turbine section of the engine, stationary turbine vanes (also termed "nozzles") are supported ("hung") on and extend inwardly from a stationary turbine outer case. The turbine blades are supported on and extend outwardly from a rotating rotor disk. Multiple stages of the stationary turbine vanes and the rotating turbine blades alternate with each other along the axial length of the turbine section, to extract the optimum power from the hot combustion gases. The stationary turbine vanes shape and direct the flow of hot exhaust gas to impinge upon the turbine blades and cause them, the rotor disk, and the shaft to turn, powering the compressor.

> [0004] The stationary turbine vanes are not rigidly supported on the turbine outer case, because of the differential movements generated by the gas forces and fatigue loading, and by the thermal expansion differences of the various portions of the structure during service. Instead, they are somewhat loosely supported by a support region and allowed to move slightly during service.
>
> [0005] The relative movements of the turbine outer case and the turbine vane in the support region prolong the life of the structure, but they can produce severe wear damage in the support region. In the usual approach to avoid or repair the damage, the support region is coated with a thermally sprayed wear-resistant coating. However, in the work leading to the present invention, the inventors have found that the thermal-spray coating approach is insufficient in many instances, particularly those where the amount and depth of wear damage are great.

However, while AAPA notes that use of a wear-resistant coating between the wear surfaces of the vane and casing, it does not disclose bonding the wear resistant coating by welding.

Ingall discloses a method of welding a wear-resistant material (40) to a turbine assembly. *See* Figure 2.

> The edges 20 and 22 of the shrouds 18 of adjacent turbine blades 10 are arranged to interlock such that in operation the edges 20 and 22 of adjacent turbine blades 10 rub together to damp vibrations of the turbine blades. The edges 20 and 22 are conventionally provided with wear resistant coatings to minimise damage to the edges 20 and 22 of the shrouds 18. The turbine blades 10 are generally cast from a nickel base alloy and cobalt base wear resistant coatings are generally applied to the edges of the shrouds.
>
> Col. 3, lines 11-21.

MITSUBISHI discloses:

> To improve wear resistance of a contact surface and use the steam turbine moving blade safely and stably over a long period of time
> by cladding by welding a welding material of a cobalt base alloy having a specified composition to a contact surface of a shroud cover formed on the tips of plural moving blades adjacent to each other at the front and rear edges thereof in the circumferential direction.

JPO Abstract.

Regarding claim 1, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have bonded the wear resistant material of AAPA, in light of the teachings of Ingall and/or MITSUIBISHI, in order to provide a wear resistant material which is stable for a long period of time.

Regarding claims 2, 7, and 9, Ingall discloses "The metallic substrate may be premachined before the weld is deposited on the metallic substrate." Col. 2, lines 12-13.

Regarding claims 3 and 10, Ingall discloses the outer case and vane may be a nickel-base alloy, and the wear-resistant material a cobalt-base alloy, *see* Col. 3, lines 40-42.

Regarding claims 4-5, and 11-12, Ingall discloses the coating can be used on various wear surface, including vanes, blades, and shrouds. Cols. 5-6, line 66-14. AAPA noted coating the vane and casing as well.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Compton whose telephone number is (571) 272-4527. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Jimenez can be reached on (571) 272-4530. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric B. Compton
Primary Examiner
Art Unit 3726

ebc